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EXAMINER

LEADER, WILLIAM T

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 05/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/806,442

Applicant(s)

RUEBEL, SUSANNE

Examiner

William T. Leader

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 26-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 26-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 37 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 37 recites that the galvanic deposition takes place from a gold sulphate bath. The use of gold sulphate baths in the process of the invention does not appear to have been described in the specification. The specification refers to gold sulphite baths rather than gold sulfate baths. For example, in paragraph [022], it is stated that “The method according to the invention can be performed with particular advantage using an aqueous gold sulfite bath . . . “.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 38, 40, 41, 47 and 48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 38 recites that the metal has “a higher concentration than conventional baths”. This limitation is indefinite because no basis has been given for determining what the concentration in a conventional bath is. Paragraph [024] states that conventional gold sulfite baths contain gold in a concentration of up to 30 g/l, but this is the subject matter of claim 39. There is no guidance as to the determination of conventional metal concentrations in other baths included within the scope of claim 38.

Claims 40 and 41 are both directed to a product. Claim 40 recites that the product is “obtainable” according to the method claim process claim 26, while claim 41 recites that the product is “manufactured” according to the method of claim 26. The difference in scope of these two claims is not apparent.

Claim 47, line 2 and claim 48, line 2 lack antecedent basis for “the inner anode”.

#### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 26-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers (4,288,298) in view of Loch (4,666,567) or Martin et al (6,071,398).

The Rogers patent is directed primarily to the field of dentistry and the construction of dental implants or dental crowns (column 1, lines 5-13). In one embodiment a molding 31, produced from artificial stone, is obtained from an impression taken from a patient's tooth stump (column 4, lines 63-66). The molding is coated with a conductive paint (column 5, lines 6-11). Gold is then electrolytically (galvanically) deposited onto the molding and may have a thickness of 200  $\mu\text{m}$  (column 5, lines 60-61). Subsequently a coating of dental porcelain is applied (column 1, lines 16-17). Rogers discloses that a variable power supply 50 is provided to supply electroplating current. Switches are provided to permit polarity reversal of the anode and cathode so that reverse plating may be performed (column 6, lines 28-35). Gold plating may take place from an aqueous gold cyanide bath (column 4, Table 1). Anode current density may be 3.2 A/dm<sup>2</sup>.

Independent claim 26 differs from the process of Rogers by reciting the use of pulse-plating in which the percentage pulse duration is at least 50%. Applicant's specification describes pulse plating broadly and notes that unipolar or bipolar pulses may be employed (paragraph [013]). The Loch patent is directed to an

automated process for electrolytically plating a metal, particularly a precious metal such as gold, onto a substrate to form uniform metallic deposits (column 1, lines 9-14, 65-67). The process utilizes improved voltage control, allowing rapid processing of the substrates and optimizing deposit thickness uniformity, maximizing plating rate, and minimizing deposit burning tendencies (column 2, line 66 – column 3, line 2; column 3, lines 23-27). To achieve these objectives, Loch applies direct current pulses in a controlled manner. The pulses may include both forward and reverse polarity, or forward pulses separated by periods of zero current (column 6, lines 23-31). The voltage control provides improved mass transfer and diffusion of the plating ions during processing (column 5, lines 64-67). The pulses are illustrated in Fig. 2B. At the beginning of plating, a maximum forward pulse may be applied for about 30 milliseconds followed by a reverse pulse applied for about 0.5 milliseconds (column 7, lines 64-67). This results in a percentage of forward pulse duration based on total cycle duration of about 98%, thereby meeting the limitation of “at least 50%” recited in instant claim 26, and “at least 70%” recited in claim 29. With a forward pulse of 30 milliseconds, Loch teaches the limitation of claim 33 that the duration of current pulses is at least 1ms and, with a cycle interval of 30.5 milliseconds, Loch teaches the limitation of claim 34 that the duration of the current intervals is at least 1ms. Representative current densities range from 10-

300 A/ft<sup>2</sup> (1.07-32.3 A/dm<sup>2</sup>), falling within the range recited in claim 31. Fig. 2B shows that square-wave pulses are used as recited in claim 30.

The Martin et al patent is directed to programmed pulse electroplating process utilizing pulsed periodic reverse current in place of DC current. The anodic to cathodic current density ratio is varied to improve the surface uniformity, appearance, grain structure and leveling of the deposit. See the abstract. By allowing the use of higher average current densities, the overall deposition rate is increased and processing times reduced thereby yielding higher production output (column 2, lines 4-8). Forward pulse times range from about 1 to 50 milliseconds, while reverse pulses range from about 0.1 to 4 milliseconds. A preferred pulse timing is 20 milliseconds forward and 1 milliseconds reverse (column 4, lines 23-28, 48-49). These ranges suggest the limitations of instant claims 26, 29 and 32-34. Switching between forward and reverse DC currents produces pulses with a square waveform as recited in claim 30. Martin et al teach that a current density between 5 and 200 A/ft<sup>2</sup> (.538-21.5 A/dm<sup>2</sup>) is typically used. This range falls within the range recited in claim 31.

The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have utilized pulse current as taught by Loch and Martin et al in the process of Rogers because plating speed and deposit properties would have been improved compared

to the use of conventional DC current. Claims 27 and 28 recite the length of time during which deposition was carried out. As recognized in the art, time of deposition is a result-effective variable related by Faraday's Law to the thickness of the deposit to be produced. Based on known principles, choice of appropriate deposition time is within the skill of the ordinary worker in the art.

7. Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers (4,288,298) in view of Loch (4,666,567) or Martin et al (6,071,398) as applied to claims 33-36 above, and further in view of Laude et al (4,192,723).

Claim 39 differs from the process of Rogers by reciting the use of a gold sulfite bath with a gold concentration of more than 30 g/l. The Laude et al patent is directed to a gold sulfite electroplating bath. Laude et al teach that gold sulfite baths are advantageous compared to gold cyanide baths for reasons of safety (column 1, lines 46-50). The bath of Laude et al is an aqueous bath and contains an ammonium-gold-sulfite complex. The amount of gold metal in the bath may range from 1 to 50 g/l (column 4, lines 41-48). This range significantly overlaps the range recited in instant claim 39. The bath can produce bright and semi-bright deposits which are homogeneous and non-porous (column 4, lines 56-58). As noted above, claim 37 recites deposition from a gold sulphate bath, even though this is not described in the specification. Laude et al teach that it is known that during



electrolysis using conventional sulfite plating baths, sulfites are oxidized into sulfates (column 2, lines 22-25). Thus, the limitation of claim 37 requiring the presence of sulphate is suggested.

It would have been obvious at the time the invention was made to have utilized the gold sulfite bath disclosed the Laude et al in the process of Rogers because gold deposits of high quality would have been formed while avoiding the safety problems associated with the cyanide bath disclosed by Rogers.

### *Claim Rejections - 35 USC § 102*

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 40-42 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rogers (4,288,298), Yamashita et al (4,820,387) or Wismann (4,488,940).

Rogers is taken as above. The Wismann patent is directed to the production of dental replacement parts. A cast part is placed in an electroplating bath, which may be a gold sulfite bath, and a layer of metal is deposited (column 4, lines 8-13). A coating of porcelain or plastic may be applied (column 4, lines 35-38).

The Yamashita et al patent is directed to a method for making dental crowns. A noble metal such as gold is electrolytically deposited onto a working model of the tooth to be restored to form an inner crown (column 5, lines 4-12). Porcelain may be built up and fused onto the inner crown (column 5, lines 12-18).

The dental reconstructions of Rogers, Wismann and Yamashita et al all have the same structure as the part recited in instant claims 40-42. It is not apparent that the part recited by applicant differs from those of the references. See MPEP section 2113 for a discussion of product-by-process claims.

10. Claims 43-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Lutz (902,892).

The Lutz patent is directed to apparatus for electroplating. Instant claim 43 recites an electrolytic cell which comprises an outer anode that at least partly surrounds a cathode to be coated. The apparatus of Lutz includes tank 2 into which are placed outer anode structure 6 and the part 2 to be coated, connected as the cathode. As shown by figures 1 and 2, anode 6 has several parts along a circumferential line enclosing the cathode as recited in instant claim 44. The parts form a generally cylindrical shaped anode structure as recited in instant claim 45. The apparatus further includes an inner anode 4, as recited in claim 46, which is shown in the figures to be in the shape of a rod, as recited in claim 47. The

apparatus of Lutz would have been capable of performing the intended use recited in the instant claims.

11. Claims 43, 45, 46 and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Soderberg et al (1,759,171).

The Soderberg et al patent is directed to apparatus for electroplating tubes internally and externally. The apparatus includes rod 1, which serves as an inner anode, and outer anodes c, c that are plates, curved to form almost a complete cylinder (page 1, lines 90-93). Workpiece A is connected as the cathode. See figure 1. The apparatus of Soderberg et al would have been capable of performing the intended use recited by applicant.

12. Claims 43, 44, 48 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Metzger (4,331,527).

The Metzger patent (4,331,527) discloses electroplating apparatus including outer anodes baskets 8 and 8a having a partial cylindrical configuration and surrounding a cathodic workpiece 4. See figure 2. Plastic shield plates 48 are placed between the anode baskets and workpiece to prevent overplating at the ends of shorter workpieces (column 2, lines 19-21 and figure 1). These shield plates

meets the limitations of instant claims 48 and 49. The apparatus of Metzger would have been capable of performing the intended use recited in the instant claims.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lust 881,810 discloses electroplating apparatus in which a plurality of workpieces are placed between inner and outer anode structures. The article by George Jernstedt teaches that the use of periodic reverse pulse plating produces better deposits at greater speeds than DC current plating. Beneficial results were observed in pilot-line production with gold plating (page 2). Production of a 0.016 inch thick deposit of copper, which required from seven to ten hours using conventional methods, was formed in less than four hours using periodic reverse pulse plating (page 4).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 703-308-2530. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are

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703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

WJL

William Leader  
May 6, 2003

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